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Paper 31
Entered: December 6, 2018

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

BMW OF NORTH AMERICA, LLC,
Petitioner,

v.

STRAGENT, LLC,
Patent Owner.

Case IPR2017-01521
Patent 8,209,705 B2

Before LYNNE E. PETTIGREW, PATRICK M. BOUCHER, and CHRISTA P. ZADO, *Administrative Patent Judges*.

Opinion for the Board filed by BOUCHER, *Administrative Patent Judge*.

Opinion Dissenting filed by ZADO, *Administrative Patent Judge*.

BOUCHER, *Administrative Patent Judge*.

FINAL WRITTEN DECISION
35 U.S.C. § 318(a) and 37 C.F.R. § 42.73

In response to a Petition (Paper 2, "Pet.") filed by BMW of North America, LLC ("Petitioner"), we instituted an *inter partes* review of claims 7–19 of U.S. Patent No. 8,209,705 B2 ("the '705 patent"). Paper 7 ("Dec."); Paper 19. During the trial, Stragent, LLC ("Patent Owner") filed a Response (Paper 10, "PO Resp.") to which Petitioner filed a Reply (Paper 24, "Reply"). An oral hearing was held with the parties, and a copy of the transcript was entered into the record. Paper 30 ("Tr.").[1]

We have jurisdiction under 35 U.S.C. § 6. This Decision is a Final Written Decision under 35 U.S.C. § 318(a) as to the patentability of the claims on which we instituted trial. Based on the record before us, Petitioner has shown, by a preponderance of the evidence, that claims 7–17 and 19 are unpatentable.

I. BACKGROUND

A. The '705 Patent

The '705 patent describes systems and methods "for sharing information in a distributed system." Ex. 1001, 1:29–30. Such systems and methods are illustrated for system architectures such as "may be situated in automotive electronics or industrial control and monitoring systems." *Id.* at 3:11–13. An example is provided in Figure 1 of the '705 patent, which is reproduced below.

[1] The hearing was a consolidated hearing for IPR2017-01519, IPR2017-01520, IPR2017-01521, and IPR2017-01522.

FIGURE 1

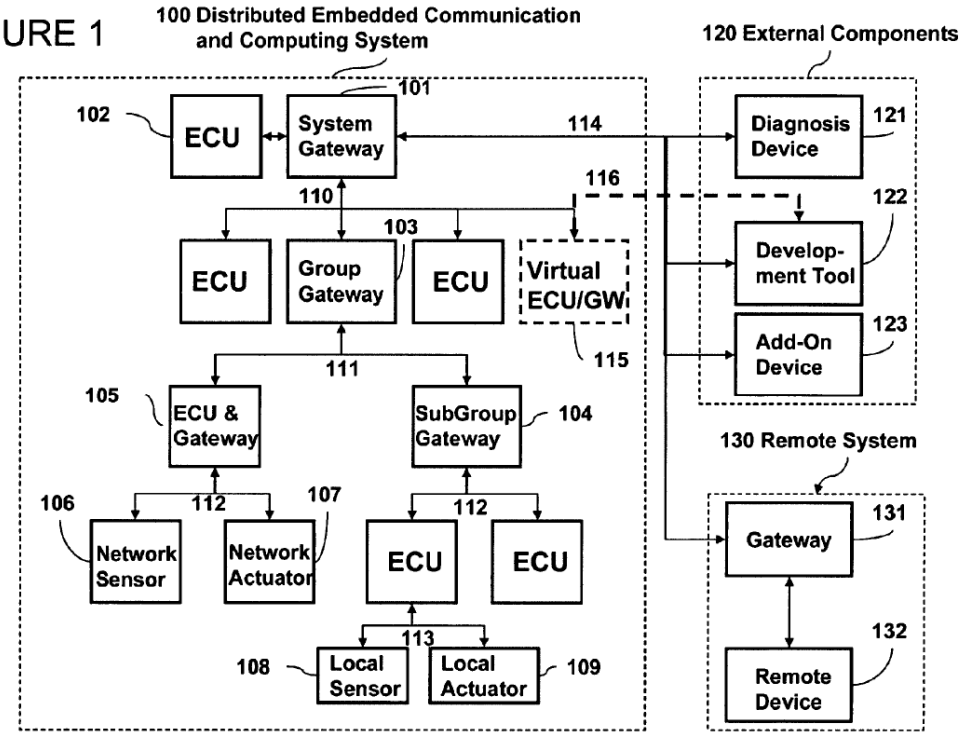


Figure 1 generally depicts elements of a distributed embedded communication and computing system. *Id.* at 3:9–11.

In an automotive environment, various electronic control units ("ECUs") control such applications as engine control, brake control, or diagnostics through connections to various sensors and actuators organized into separate subnetworks. *Id.* at 3:13–18. Such applications are themselves grouped into backbone system functions, such as "body control, power train, and chassis." *Id.* at 3:19–21. With a hierarchical organization that includes gateways 101, 103, 104, 105, messages are relayed up and down through the system layers. *Id.* at 3:24–26. Each layer may contain multiple ECUs connected through wired serial multiplexing bus systems, with the '705 patent noting several examples that include Controller Area Network ("CAN"), Local Interconnect Network ("LIN"), and Flexray. *Id.* at 3:26–33.

At the highest level in the hierarchy, "the system level," system gateway 101 is connected via various busses to other system-level ECUs, to subsequent gateways 103, and to external components 120. *Id.* at 3:60–67. In addition, system gateway 101 may be connected to external gateway 131 to link the system to remote device 132. *Id.* at 4:1–6. "Subsequent to the system level may be several layers of groups and subgroups that are link[ed] to the higher levels via gateways (101, 103, 104, 105)." *Id.* at 4:7–9.

In operation, ECU 102 receives "real-time" input variables from local sensors 108 or from networked sensors 106, respectively via signal lines 113 or multiplexing bus system 112. *Id.* at 3:39–42. "[R]eal-time may include any response time that may be measured in milli- or microseconds, and/or is less than 1 second." *Id.* at 3:36–38. ECU 102 processes the input variables and generates output variables that may be shared with other ECUs 102. *Id.* at 3:46–51. Two relevant modes of sharing are described.

First, ECUs 102 "typically share information with devices that are connected on the same physical multiplexing system. This method of information sharing is called horizontal information sharing in a hierarchical system." *Id.* at 3:51–55.

Second, a bulletin board may be used so that "the information is shared, in real-time, among a plurality of heterogeneous processes." *Id.* at 1:31–33. According to the '705 patent, "heterogeneous networks may refer to any different communication networks with at least one aspect that is different." *Id.* at 7:27–29. Figure 7 of the '705 patent, reproduced below, illustrates a logical architecture between three heterogeneous network controllers using such a bulletin board.

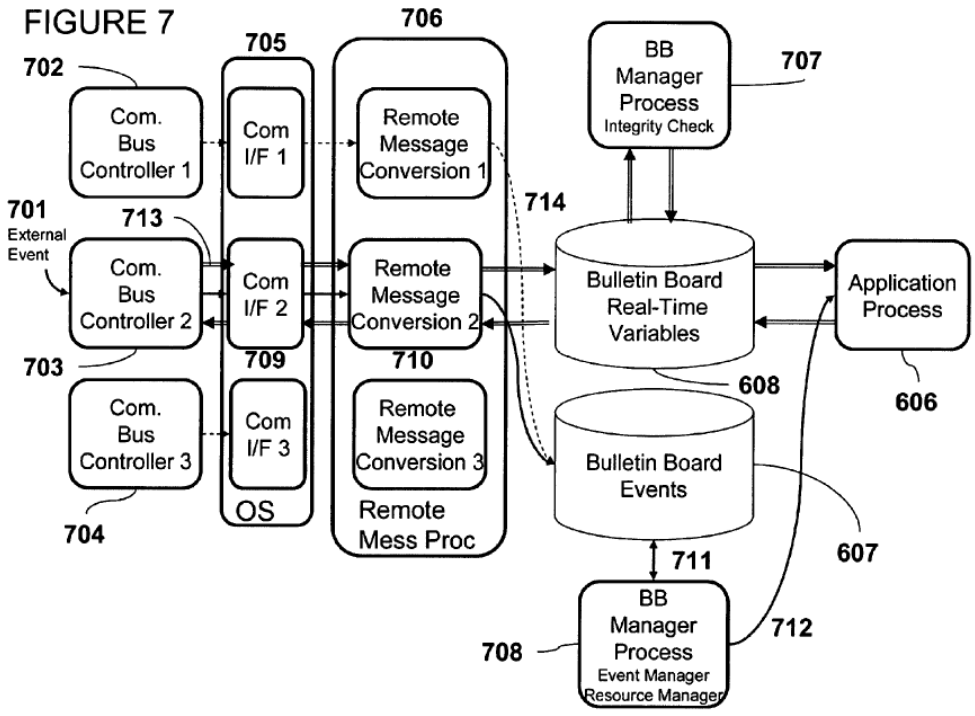


Figure 7 illustrates a system architecture in which a bulletin board acts as a shared memory interacting with multiple communication busses, with data received from one communication bus stored on the bulletin board and shared as a new message with other network types. *Id.* at 7:4–37.

The illustrated architecture includes four principal components: (1) network controllers 702, 703, and 704 (first column) for each of multiple heterogeneous networks; (2) associated operating system interfaces 705 for each of the heterogeneous networks (second column); (3) remote message communication processes 706 for stripping out network-specific information (third column); and (4) the bulletin board, which may contain events 607, real-time variables 608, configuration parameters, and firmware. *Id.* at 5:63–67, 6:33–37. In operation, external event 701, such as a flag indicating that data from a sensor are available, is transmitted on a network to a communication bus controller, such as network controller 703 in the

drawing. *Id.* at 7:4–9. This causes an operating system interface (such as communication interface 709) to notify a remote message communication process (such as remote message conversion method 710) that data are available, with notification provided in turn to application process 606. *Id.* at 7:4–17.

B. Prosecution History

The '705 patent is a continuation of U.S. Patent No. 7,802,263 ("the '263 patent"), filed December 15, 2003, and claims the benefit of the filing date of U.S. Provisional Application No. 60/434,018 ("the '018 provisional application"), filed December 17, 2002. Ex. 1001 at [60], [63].

At the time of filing the application that matured into the '263 patent, independent claim 1 recited the following:

> 1. A method for sharing information in a distributed system, comprising:
>
> receiving information;
>
> storing the information on a bulletin board; and
>
> sharing, in real-time, the information among a plurality of heterogeneous processes.

Ex. 1011, 649. Although certain amendments were made to the claim during prosecution, allowance was secured only after an interview with the Examiner in which the applicants authorized the addition of several limitations that Petitioner characterizes as "memory-related": (1) "requesting a bulletin board resource of one or more bulletin boards"; (2) "determining whether the bulletin board resource is available"; (3) "in the event the bulletin board resource is not available, re-requesting the bulletin board resource until a threshold has been reached"; and (4) storing

the information on the bulletin board resource "in the event the bulletin board resource is available." *Id.* at 250–252; *see* Pet. 5–6.

The claim that matured into independent claim 7 of the '705 patent (originally filed claim 19) generally paralleled the form of independent claim 1 of the '263 patent at the time of filing, but recited a "computer program product" rather than a "method":

> 19. A computer program product for sharing information in a distributed system, comprising:
>
> computer code for receiving information;
>
> computer code for storing the information on a bulletin board; and
>
> computer code for sharing, in real time, the information among a plurality if heterogeneous processes.

Ex. 1002, 257. During prosecution, the applicants authorized, among other amendments, the addition of what Petitioner characterizes as "memory-related limitations similar to those in the claims of the '263 patent":

> computer code for, in the event the storage resource is not available, <u>determining whether a timeout has been reached and</u> causing a re-request in connection with the storage resource;
>
> computer code for, in the event the storage resource is available, causing storage of the information utilizing the on a bulletin board storage resource <u>if the timeout has not been reached;</u> [and]
>
> <u>computer code for, in the event the timeout has been reached, causing an error notification to be sent</u>.

Id. at 87–90 (underscoring in original to identify material added by amendment). These added limitations were among those identified by the Examiner in allowing the application as not "disclose[d] or suggest[ed]" "when taken in the context of [the] claims as a whole." *Id.* at 98–99.

C. Illustrative Claim

Challenged claim 7, which is illustrative of the challenged claims, is reproduced below with numbers added to identify specific elements of the claim in accordance with the scheme used by Petitioner. *See* Pet. 10–11.

> 7. [0] A non-transitory computer-readable medium storing a computer program product for sharing information, the computer program product comprising:
>
> [1] computer code for allowing receipt of information associated with a message, utilizing a first network protocol associated with a first network;
>
> [2] computer code for causing a determination as to whether a storage resource is available;
>
> [3] computer code for, in the event the storage resource is not available, determining whether a timeout has been reached and causing a re-request in connection with the storage resource;
>
> [4] computer code for, in the event the storage resource is available and the timeout has not been reached, causing storage of the information utilizing the storage resource;
>
> [5] computer code for, in the event the timeout has been reached, causing an error notification to be sent;
>
> [6] computer code for causing the information to be shared by:
>
> [7] in real-time, sharing the information utilizing at least one message format corresponding to a second network protocol associated with a second network which is different from the first network protocol;
>
> [8] wherein the computer program product is associated with an electronic control unit with at least one gateway function, and a plurality of interface portions including:
>
> [9] a first interface portion for interfacing with the first network, the first interface portion including a first interface-related first layer part for receiving first interface-related first layer messages and a first interface-related second layer part, the first interface-related first layer messages being processed after which first interface-related second layer messages are provided, where the first network is at least one of a Controller Area

> Network, a Flexray network, or a Local Interconnect Network; and
>
> [10] a second interface portion for interfacing with the second network, the second interface portion including a second interface-related first layer part for receiving second interface-related first layer messages and a second interface-related second layer part, the second interface-related first layer messages being processed after which second interface-related second layer messages are provided, where the second network is different from the first network and is at least one of the Controller Area Network, the Flexray network, or the Local Interconnect Network.

Ex. 1001, col. 13, ll. 5–52.

D. Evidence

Petitioner relies on the following references. Pet. 15–19.

Staiger	US 2002/0073243 A1	June 13, 2002	Ex. 1004
Millsap	US 6,484,082 B1	Nov. 19, 2002	Ex. 1015

William Wong, *Software And Hardware Standards Help, But In-Vehicle Network Growth Will Be Conservative: CAN networks and OSEK/VDX-compatible operating systems will drive tomorrow's vehicles*, 49 Elec. Design 62 (Jan. 8, 2001) ("Wong") (Ex. 1012).

In addition, Petitioner provides Declarations by Vijay K. Madisetti and R. Benjamin Cassady, which we have also considered. Exs. 1003, 1014. No cross-examination testimony of these witnesses was filed in the proceeding.

Patent Owner provides a Declaration by Jeffrey A. Miller, Ph.D. Ex. 2001. Dr. Miller was cross-examined by Petitioner, and a transcript of his deposition was entered into the record. Ex. 1027.

E. Asserted Grounds of Unpatentability

Petitioner challenges claims 7–19 under 35 U.S.C. § 102(a) as anticipated by Staiger, and challenges claims 7–19 under 35 U.S.C. § 103(a) as obvious over Staiger, Millsap, and Wong. Pet. 14–15.

F. Real Parties in Interest

Petitioner identifies BMW of North America, LLC, BMW Manufacturing Co., LLC, and Bayerische Motoren Werke, AG as real parties-in-interest in this proceeding. Pet. 60.

Patent Owner identifies only itself as a real party-in-interest. Paper 4, 1.

G. Related Proceedings

The parties identify the following district-court proceedings as involving the '705 patent: (1) *Stragent, LLC v. BMW of North America, LLC*, No. 6:16-cv-00446 (E.D. Tex.); (2) *Stragent, LLC v. Mercedes-Benz USA, LLC*, No. 6:16-cv-00447 (E.D. Tex.); and (3) *Stragent, LLC v. Volvo Cars of North America, LLC*, No. 6:16-cv-00448 (E.D. Tex.). Pet. 60; Paper 4, 1–2.

The following *inter partes* review proceedings also involve the '705 patent: IPR2017-00458, IPR2017-00676, IPR2017-01502, and IPR2017-01522. The following *inter partes* review proceedings involve U.S. Patent No. 8,556,843 B2 ("the '843 patent"), which is a continuation of the '705 patent: IPR2017-00457, IPR2017-00677, IPR2017-01503, IPR2017-01504, IPR2017-01519, and IPR2017-01520.

II. ANALYSIS

A. Claim Construction

In an *inter partes* review proceeding based on a petition filed prior to November 13, 2018, the Board interprets claims of an unexpired patent using the broadest reasonable construction in light of the specification of the patent in which they appear. *See* 37 C.F.R. § 42.100(b) (2016); *Cuozzo Speed Techs., LLC v. Lee*, 136 S. Ct. 2131, 2144–46 (2016) (upholding the use of the broadest reasonable interpretation standard).[2] An inventor may provide a meaning for a term that is different from its ordinary meaning by defining the term in the specification with reasonable clarity, deliberateness, and precision. *In re Paulsen*, 30 F.3d 1475, 1480 (Fed. Cir. 1994).

1. "real-time"

Independent claim 7 recites "in real-time, sharing the information." Ex. 1001, 13:24–25. The term "real-time" also appears in dependent claim 17. *Id.* at 14:28. Petitioner argues that the Specification of the '705 patent expressly defines "real-time": "In the context of the present description, real-time may include any response time that may be measured in milli- or

[2] The Office recently promulgated changes to the claim-construction standard applied in *inter partes* review proceedings. *Changes to the Claim Construction Standard for Interpreting Claims in Trial Proceedings Before the Patent Trial and Appeal Board*, 83 Fed. Reg. 51,340 (Oct. 11, 2018). Because the Petition was filed before November 13, 2018, effective date of the rule change, however, those changes do not apply to this proceeding. *Id.* at 51,345 ("The Office will continue to apply the BRI standard for construing unexpired patent claims . . . in AIA proceedings where a petition was filed before the effective date of the rule.").

microseconds, and/or is less than 1 second." Pet. 12–13; Ex. 1001, 3:35–38. Accordingly, Petitioner proposes that "'real-time' should be construed as responses that occur in less than one second." Pet. 13 (citing Ex. 1003 ¶ 56). Patent Owner contends that the definition from the Specification should be adopted. PO Resp. 15.

We construe "real-time" as Petitioner proposes, i.e., as including responses that occur in less than one second. The first part of the quote cited above provided in the Specification ("may be measured in milli- or microseconds") is not limiting because *any* response time, no matter how large or small, may be *measured* in milli- or microseconds.

2. "isolated from temporal characteristics"

Dependent claim 10 recites that "at least one of the different processes process the information in a manner that is isolated from temporal characteristics associated with at least one of a plurality of heterogeneous networks." Ex. 1001, 13:54–67. Petitioner proposes that "isolated from temporal characteristics" be construed as "unaffected by the temporal behavior," and supports its proposed construction with examples provided in the Specification and with testimony by Dr. Madisetti. Pet. 13 (citing Ex. 1001, 8:47–51, 8, 64–9:2, 11:10–13; Ex. 1003 ¶ 57). Patent Owner does not address construction of the term. Petitioner's proposed construction is reasonable, and we adopt it.

3. "heterogeneous networks"

As noted above, dependent claim 10 recites isolation from temporal characteristics associated "with at least one of a plurality of heterogeneous

networks." Ex. 1001, 13:66–67. The Specification of the '705 patent defines "heterogeneous networks": "In the context of the present description, heterogeneous networks may refer to any different communication networks with at least one aspect that is different." Ex. 1001, 7:26–29. In light of this explicit definition, we construe "heterogeneous networks" as Petitioner proposes, i.e., as "networks having at least one aspect that is different." Pet. 13–14 (citing Ex. 1003 ¶ 58). Patent Owner does not address construction of the term.

4. "diagnostic mode"

Dependent claim 18 recites that "multiple modes of operation are enabled, wherein at least one of the modes includes a diagnostic mode." Ex. 1001, 14:33. The Specification of the '705 patent states the following as an enhancement that addresses shortcomings of traditional computer networks:

> The concept that an embedded communication and computing network can run in multiple modes in order to provide for a guaranteed deterministic behavior of the system. This property can be achieved by only allowing change to the configuration and/or the functions (SW code) in a secured configuration and upgrade mode. *If the network is booted in the normal operating mode*, all processors execute the existing code and only allow data sharing through the bulletin boards. *The emergency or debug mode lets the network run* in a fail-safe reduced operation mode or *in a diagnostic mode that allows inspection of the system, while it is running.* For each operating mode, the gateway can store a processing image on the bulletin board. The advantage of this procedure is that only the communication hubs need to deal with secure data transfer and encryption while the peripheral nodes in the network can be relative[ly] simple in design.

Id. at 11:51–67 (emphases added). In light of this disclosure the parties agree that a "diagnostic mode" is a mode that allows inspection of the system while it is running. Pet. 14; PO Resp. 19–20; Reply 11. But Patent Owner contends, in view of the emphasized portions of the disclosure reproduced above, that a "diagnostic mode" is also "a distinct mode from the 'normal operating mode.'" PO Resp. 19.

Patent Owner has the more compelling position, particularly in light of the claim's recitation that "multiple modes of operation are enabled." Ex. 1001, 14:32. Within the context of such multiple modes, and the Specification's description of different modes as distinct from "the normal operating mode," it would be unreasonable to adopt a construction in which a "normal operating mode" that has diagnostic capability falls within the scope of the recited "diagnostic mode."

Accordingly, we construe "diagnostic mode" similarly to how Patent Owner proposes, as a mode, distinct from normal operation, that allows inspection of the system while it is running.

5. Information Sharing

Patent Owner addresses limitations 7.6, 7.7, and 7.10 of the only challenged independent claim, i.e., claim 7, in the context of how they relate to sharing of information. PO Resp. 14–19. Limitations 7.6 and 7.7 recite "computer code for causing the information to be shared by: in real-time, sharing the information utilizing at least one message format corresponding to a second network protocol associated with a second network." Ex. 1001, 13:23–27. According to Patent Owner, "the words '*the* information' clearly refer to information previously identified in the claims." PO Resp. 14.

Patent Owner contends that such information is "the 'information associated with a message, utilizing a first network protocol associated with a first network' (limitation 1.1) which was caused to be stored utilizing the storage resource (limitation 7.4) – i.e., it is information whose storage was completed to the bulletin board or the storage resource." *Id.* Bootstrapping this argument, Patent Owner similarly contends that "the second network" recited in limitation 7.10 is "utilizing a second different protocol which is the recipient of the 'shared' information connected to the storage resource." *Id.* at 16–17 (citing Ex. 2001 ¶ 33–34).

Patent Owner thus contends that information sharing requires completion of storage to the recited bulletin board or storage resource. Patent Owner also cites a general-dictionary definition of "share" as "to partake of, use, experience, occupy, or enjoy with others; to have in common." *Id.* at 15 (citing Ex. 2003).

We are not persuaded by Patent Owner's contention. Outside of the preamble, claim 7 first recites "information" as part of the requirement of "computer code for allowing receipt of information associated with a message, utilizing a first network protocol associated with a first network." Ex. 1001, 13:8–10. The claim includes recitations for various code that contemplate potentially different actions depending on the satisfaction of different conditions. For example, code causes a "determination as to whether a storage resource is available," and, "in the event the storage resource is available," code "caus[es] storage of the information utilizing the storage resource." Ex. 1001, 13:11–12, 13:18–20. But additional code causes "a re-request in connection with the storage resource" in the event the storage resource is not available, and causes an error notification to be sent if

"the timeout has been reached." *Id.* at 13:14–17, 13:21–22. The plain language of the claim does not require that "the information" be stored using the "storage resource" under all conditions.

The plain language of the claim *does*, though, always require the presence of "computer code for causing the information to be shared," specifically by "in real-time, sharing the information utilizing at least one message format corresponding to a second network protocol associated with a second network." *Id.* at 13:24–27. Nothing in the plain language of this element requires that "the information" have been stored with the storage resource. Indeed, Petitioner identifies "embodiments of the specification that share information not using a shared storage." Reply 8–9. In particular, the Specification of the '705 patent describes "horizontal information sharing in a hierarchical system" where output variables generated by an ECU are output to local actuators, which are connected via discrete signal lines or networked actuators connected via a multiplexing bus. *See* Ex. 1001, 8:51–59, 7:38–49 ("In an alternate embodiment of the remote message communication process . . . [t]o communicate between two heterogeneous networks, this process may then be repeated in reverse by adding back the header information for the various layers of the second network, and eventually putting the message onto the second network's physical link."); *see* Tr. 10:19–12:7 (Petitioner, at oral hearing, discussing embodiment that shares information without using a shared storage). Furthermore, the description of "information" as "capable of being stored *and* shared" in the '705 patent Specification is consistent with storage and sharing being distinct concepts. *See* Ex. 1001, 3:56–59 (emphasis added).

At the oral hearing, in discussing similar limitations that appear in independent claim 1 of the related '843 patent, Patent Owner argued that "the information" recited in element 1.7 ("in real time, sharing *the information* utilizing at least one message format corresponding to a second network protocol associated with a second network") (emphasis added) necessarily refers to "the information" recited in element 1.5 (code for, in the event the storage resource is available, causing storage of *the information* utilizing the storage resource") (emphasis added):

> Our position is that the information then appears in Element 1.5, which says the information is stored utilizing a storage resource. Therefore, the next time the word the information is used, it's now referring to the last antecedent basis, which is no longer Element 1.1. The last antecedent is Element 1.5.

Tr. 48:10–14. But Patent Owner is unable to identify sufficient legal basis for its "last antecedent" theory. *See id.* at 40:8–15 ("I have not found the concept in patent claim construction.").

In addition to these considerations, we note that Patent Owner has submitted a definition of "share" drawn from a technical dictionary into the record of this proceeding. Ex. 2004.[3] We find the technical dictionary provided by Patent Owner to be more probative than the general-purpose dictionary Patent Owner quotes.

[3] We note that, even if Patent Owner had not entered Exhibit 2004 into this proceeding, judges are free to rely on extrinsic dictionary definitions when construing claim terms, so long as the dictionary definition does not contradict any definition found in or ascertained by a reading of the patent documents. *Vitronics Corp. v. Conceptronic, Inc.*, 90 F.3d 1576, 1584 n.6 (Fed. Cir. 1996) *see Phillips v. AWH Corp.*, 415 F.3d 1303, 1322–23 (Fed. Cir. 2005) (en banc).

The language of the general-purpose dictionary definition of "share" that states "to partake of, use, experience, occupy, or enjoy with others; to have in common," does not appear to contemplate the sharing of "information," which the '705 patent Specification describes as "includ[ing] data, a signal, and/or anything else capable of being stored and shared." *See* Ex. 2003 (general definition of "share"); Ex. 1001, 3:56–59. Instead, the technical definition of "[t]o make files, directories, or folders accessible to other users over a network" is more relevant because it expressly contemplates the same context as the '705 patent, i.e., sharing over a network. Ex. 2004 (technical definition of "share").

Thus, the plain language of the claim, intrinsic evidence in the form of the Specification, and extrinsic evidence in the form of a technical-dictionary definition all support a construction of information sharing that requires making the information accessible, without requiring storage of the information. We accordingly construe the various recitations of information sharing in the claims in accordance with such requirements.

6. Other Terms

We do not find it necessary, for purposes of this Decision, to construe any other terms explicitly. *See Nidec Motor Corp. v. Zhongshan Broad Ocean Motor Co.*, 868 F.3d 1013, 1017 (Fed. Cir. 2017) (citing *Vivid Techs., Inc. v. Am. Sci. & Eng'g, Inc.*, 200 F.3d 795, 803 (Fed. Cir. 1999)) (only terms in controversy need to be construed, and only to the extent necessary to resolve the controversy).

B. Effective Filing Date

Petitioner contends that the challenged claims are entitled to claim the benefit of only the December 15, 2003, filing date of the '263 patent, and, in particular, that they are not entitled to the December 17, 2002, filing date of the '018 provisional application. Pet. 7–9. Petitioner argues that "the '263 patent is the first instance where Patent Owner even arguably disclosed" the memory-related limitations," and that the '018 provisional application does not disclose

> at least the following limitations of claim 7: "computer code for, in the event the storage resource is not available, determining whether a timeout has been reached and causing a re-request in connection with the storage resource," "computer code, in the event the storage resource is available and the timeout has not been reached, causing storage of the information utilizing the storage resource," and "computer code for, in the event the timeout has been reached, causing an error notification to be sent." Ex. 1001, claim 7, *see generally* EX1005.

Id. at 9. Petitioner further contends that "the ['018] provisional application simply and generally states that 'the bulletin board manager provides mechanisms for access control,'" and that "[t]his broad statement in no way discloses the claim limitations as described above." *Id.* (citing Ex. 1005, 8). Patent Owner does not present any evidence or argument that the '705 patent is entitled to claim the benefit of the '018 provisional application filing date.

For a claim of a patent to claim priority from the filing date of its provisional application, the provisional application must contain a written description of the claim in the manner set forth under 35 U.S.C. § 112. 35 U.S.C. § 119(e)(1). Although a petitioner bears the ultimate burden of persuasion to show a claim is unpatentable, a second and distinct burden—

the burden of production—is a shifting burden. *Dynamic Drinkware, LLC v. National Graphics, Inc.*, 800 F.3d 1375, 1378 (Fed. Cir. 2015). In cases such as here, where Petitioner has presented sufficient evidence and argument of unpatentability based on a reference that pre-dates the filing date of the '705 patent, Petitioner meets its initial burden of production. *Id.* at 1379. The burden then shifts to Patent Owner to show that the '018 provisional application provides written description support for the challenged claims of the '705 patent. *Id.* at 1380. As we discuss above, Patent Owner does not provide any evidence or argument in this regard, and therefore does not meet its burden of production to show the challenged claims are entitled to the benefit of the '018 provisional application filing date. Therefore, based on the record, we accord the challenged claims the December 15, 2003, filing date of the '263 patent.

We note that, although the burden has not shifted to Petitioner, the Petition identifies specific claim limitations Petitioner contends are unsupported by the '018 provisional application and identifies specific disclosure in the '018 provisional application that it contends is insufficient. Pet. 4–5.

C. Legal Principles

To establish anticipation, each and every element in a claim, arranged as recited in the claim, must be found in a single prior art reference. *Net MoneyIN, Inc. v. VeriSign, Inc.*, 545 F.3d 1359, 1369 (Fed. Cir. 2008); *Karsten Mfg. Corp. v. Cleveland Golf Co.*, 242 F.3d 1376, 1383 (Fed. Cir. 2001). While the elements must be arranged in the same way as is recited in the claim, "the reference need not satisfy an *ipsissimis verbis* test." *In re*

Gleave, 560 F.3d 1331, 1334 (Fed. Cir. 2009); *In re Bond*, 910 F.2d 831, 832–33 (Fed. Cir. 1990). Identity of terminology between the anticipatory prior art reference and the claim is not required. Prior art references must be "'considered together with the knowledge of one of ordinary skill in the pertinent art.'" *In re Paulsen*, 30 F.3d 1475, 1480 (Fed. Cir. 1994).

Also, "it is proper to take into account not only specific teachings of the reference but also the inferences which one skilled in the art would reasonably be expected to draw therefrom." *In re Preda*, 401 F.2d 825, 826 (CCPA 1968). As the Court of Appeals for the Federal Circuit recently explained, the dispositive question for anticipation is whether one skilled in the art would reasonably understand or infer from a prior art reference that every claim element is disclosed in that reference. *Eli Lilly v. Los Angeles Biomedical Research Inst.*, 849 F.3d 1073, 1074–1075 (Fed. Cir. 2017).

A claim is unpatentable for obviousness under 35 U.S.C. § 103(a) if the differences between the claimed subject matter and the prior art are "such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains." *KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. 398, 406 (2007). The question of obviousness is resolved on the basis of underlying factual determinations, including: (1) the scope and content of the prior art; (2) any differences between the claimed subject matter and the prior art; (3) the level of skill in the art; and (4) when in evidence, objective

indicia of non-obviousness, i.e., secondary considerations.[4] *Graham v. John Deere Co.*, 383 U.S. 1, 17–18 (1966).

Additionally, the obviousness inquiry typically requires an analysis of "whether there was an apparent reason to combine the known elements in the fashion claimed by the patent at issue." *KSR*, 550 U.S. at 418 (citing *In re Kahn*, 441 F.3d 977, 988 (Fed. Cir. 2006) (requiring "articulated reasoning with some rational underpinning to support the legal conclusion of obviousness")); *see In re Warsaw Orthopedic, Inc.*, 832 F.3d 1327, 1333 (Fed. Cir. 2016) (citing *DyStar Textilfarben GmbH & Co. Deutschland KG v. C. H. Patrick Co.*, 464 F.3d 1356, 1360 (Fed. Cir. 2006)).

To prevail on its challenges, Petitioner must demonstrate by a preponderance of the evidence that the claims are unpatentable. 35 U.S.C. § 316(e); 37 C.F.R. § 42.1(d). "In an [*inter partes* review], the petitioner has the burden from the onset to show with particularity why the patent it challenges is unpatentable." *Harmonic Inc. v. Avid Tech., Inc.* 815 F.3d 1356, 1363 (Fed. Cir. 2016) (citing 35 U.S.C. § 312(a)(3) (requiring *inter partes* review petitions to identify "with particularity . . . the evidence that supports the grounds for the challenge to each claim")). This burden never shifts to Patent Owner. *See Dynamic Drinkware*, 800 F.3d at 1378 (citing *Tech. Licensing Corp. v. Videotek, Inc.*, 545 F.3d 1316, 1326–27 (Fed. Cir. 2008)) (discussing the burden of proof in *inter partes* review). Furthermore, Petitioner does not satisfy its burden of proving obviousness by employing

[4] The parties do not address secondary considerations, which accordingly do not form part of our analysis.

"mere conclusory statements." *In re Magnum Oil Tools Int'l, Ltd.*, 829 F.3d 1364, 1380 (Fed. Cir. 2016).

D. Level of Skill in the Art

The parties advocate for the adoption of similar levels of ordinary skill in the art. Petitioner contends that a person of ordinary skill "would have a bachelor's degree in electrical engineering, computer engineering, or a related engineering discipline and at least two years of industry experience in the field of distributed computing or automotive engineering, or equivalent experience, education, or both." Pet. 10. In addition, Petitioner contends that such a person "would also have knowledge or familiarity with in-vehicle computing." *Id.* (citing Ex. 1003 ¶¶ 62–63). Dr. Madisetti's testimony supports Petitioner's proposal. Ex. 1003 ¶¶ 62–63.

> Patent Owner similarly contends that a person of ordinary skill would have had at least the qualifications of or equivalent to either a master's degree in electrical engineering, computer science, or computer engineering with course work or research in embedded networking technologies or an undergraduate degree in electrical engineering, computer science, or computer engineering with at least two years of relevant work experience in industry.

PO Resp. 20. Dr. Miller's testimony supports Patent Owner's proposal. Ex. 2001 ¶ 17. The principal difference between the levels proposed by the parties is Petitioner's requirement that the person have knowledge or familiarity with "in-vehicle computing." Although the Specification illustrates its systems and methods for sharing information in a distributed system in the context of vehicle applications, the claims are not so limited.

We are not persuaded that familiarity with in-vehicle computing would be a characteristic of a person of ordinary skill. We therefore adopt Patent Owner's expression of the level of skill in the art in the relevant art, noting that it instead requires some level of familiarity with embedded networking technologies.

E. Testimony of Dr. Miller

Petitioner argues that the testimony of Patent Owner's expert, Dr. Miller "deserves little weight because he misapplies the law and provides contradictory testimony." Reply 2. Specifically, Petitioner contends that Dr. Miller (1) does not understand or apply the principles of broadest reasonable interpretation in his claim constructions; (2) imports limitations from the Specification into the claims; (3) does not understand what defines an invention; and (4) cannot identify an antecedent basis. *Id.* at 2–3.

As Petitioner recognizes, in a related *inter partes* review proceeding, we "agree[d] with Petitioner that Dr. Miller did not provide responses sufficient to conclude that he was aware of and/or applied the correct claim-construction standard." *BMW of N. Am., LLC v. Stragent, LLC*, Case IPR2017-00677, slip op. at 13–14 (PTAB June 16, 2018) (Paper 32). But deficiencies in Dr. Miller's testimony in that earlier proceeding have largely been cured in the instant proceeding. *See, e.g.*, Ex. 2001 ¶ 26 ("I have been advised, and it is my understanding, that patent claims in IPR proceedings such as this are given their broadest reasonable construction in view of the patent claims, specification, file history, and the understanding of one having ordinary skill in the art at the time of the invention.").

We have reviewed the deposition testimony to which Petitioner draws our attention, and disagree that Dr. Miller's imprecisions regarding patent law are sufficient to discount or limit the weight accorded to his opinions. *See* Reply 3–7. Technical experts are not expected to be legal authorities, and Dr. Miller's opinions are helpful to us as the trier of fact. *See* Fed. R. Evid. 702 (stating conditions under which an expert witness may testify in the form of an opinion). We are also not persuaded by Petitioner's argument that Dr. Miller's opinions should be given reduced weight because "he is a pay for opinion expert, whose opinions reflect counsel instructions rather than his views." Reply 5. Despite Petitioner's allusions, we see nothing irregular or improper with Dr. Miller's acknowledgment that Patent Owner's "attorneys did provide some clarifications and help in preparing the declaration." *See id*.; Ex. 1027, 30:21–24. Dr. Miller swears to the statements in his Declaration under penalty of perjury, and we see no compelling reason not to accord those states due weight. Ex. 2001, 50.

F. Obviousness over Staiger, Millsap, and Wong

1. Staiger

Staiger, which "relates to a method and a circuit arrangement for communication within and across networks," was filed on December 4, 2001, and published on June 13, 2002. Ex. 1004 ¶ 1, [22], [43]. Consistent with the effective filing date we accord the challenged claims herein, Staiger is prior art under 35 U.S.C. §§ 102(a), 102(b), and 102(e).

Staiger, like the specification of the '705 patent, describes network communications in automobiles. *Id.* ¶ 2. Staiger discloses that "[t]hrough the networks the computer systems are able to collect information from

different mostly remote systems" and that "[t]he information might contain parameters describing the state of operation of the remote systems which are meant to be controlled or monitored by the computer system receiving the information." *Id.* In particular, Staiger discloses an Electronic Control Unit ("ECU") "connected to a plurality of real-time networks, e.g., several individual CAN (Controller Area Network) busses or other multiple purpose networks, like multimedia-networks, such as MOST (Media Oriented Systems Transport), i.e., an optical bus system used in automobiles, or IEEE1394 (Firewire)." *Id.* ¶ 3. The ECU executes an application program for controlling remote systems while concurrently performing gateway functions between the different networks. *Id.* ¶¶ 4–5.

Figure 2 of Staiger is reproduced below.

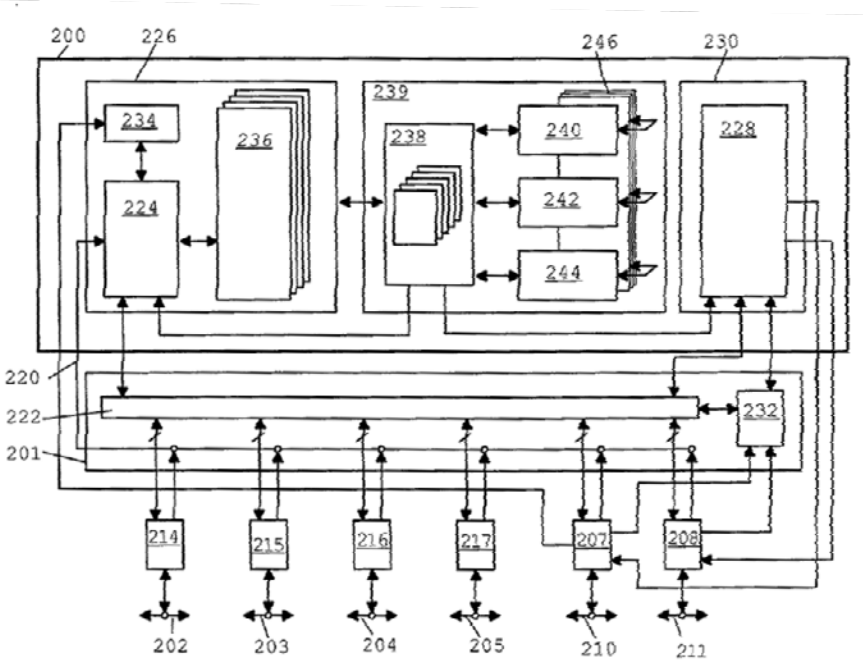


FIG. 2

Figure 2 depicts a high-level block diagram of intercommunication processor 200, connected to switchboard 201, "which is designed to connect four individual CAN-busses 202 to 205 and in addition a first and a second independent CPU 207 and 208." *Id.* ¶ 36 (emphasis omitted). Each of CAN busses 202–205 is connected to a respective bus adapter 214–217, which may be formed by standardized CAN controllers providing connections to the respective CAN busses 202–205. *Id.* ¶ 38. First and second CPUs 207 and 208 provide connections to first and second additional bus systems 210 and 211, respectively. *Id.* ¶ 36. Can-busses 202 to 205 may be compatible with one of the CAN-B network protocol or the CAN-C network protocol. *See id.* ¶ 38. "Connecting up to four CAN busses and one or two CPUs together represents a typical network requirement used in modern automobiles. However, . . . the present invention is neither limited to this particular bus system[], the specific number of busses nor to the number of CPUs connected to it." *Id.* ¶ 37. Figure 2 also depicts execution tag registry 238, which Staiger describes as being "connected to a first, a second and a third execution unit 240 to 244 which can access a register pool 246 for storing data and for exchanging data among the execution units 240 to 244." *Id.* ¶ 41.

2. Millsap

Millsap, which relates to "[a] network management approach for use in a vehicle to control activation of electronic control units (ECUs) networked together throughout the vehicle," was filed on May 24, 2000, and issued on November 19, 2002. Ex. 1015 at [22], [45], [57]. Consistent with

the effective filing date we accord the challenged claims herein, Millsap is prior art under 35 U.S.C. §§ 102(a) and 102(e).

Millsap, like Staiger and the specification of the '705 patent, describes network communications in automobiles. *Id.* at [57]. Millsap describes "an on-board vehicle network which utilizes a network management strategy that permits distributed ECUs on the network." *Id.* at 2:27–33.

Figure 9 of Millsap is reproduced below.

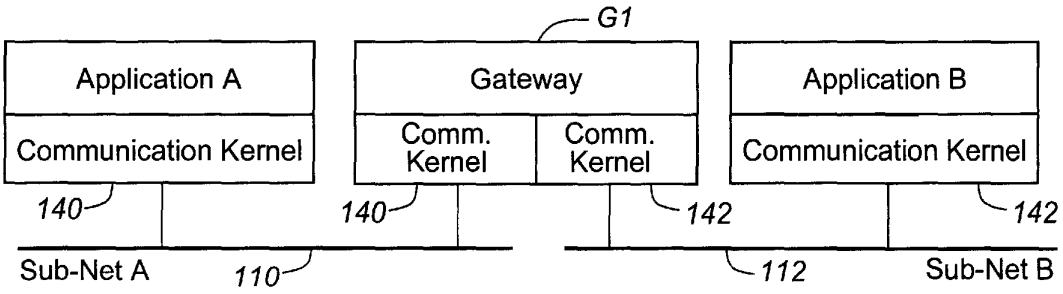


Fig. 9

Figure 9 depicts Gateway G1 comprising two interfaces, Comm. Kernel 140 ("communication kernel") and Comm. Kernel 142, connected to two different networks, SubNet A and SubNet B. *Id.* SubNet A is connected via high-speed bus 110, and SubNet B is connected via low-speed bus 112. *Id.* at 12:27–30. Each communication kernel includes a data link layer ("DLL") and a physical layer that provides conversion of digital data symbols (i.e., 1's and 0's) generated by the data link layer into electrical signals transmitted on the bus. *Id.* at 12:42–51.

3. Wong

Wong, which relates to automotive networks, was purportedly published on January 8, 2001. Ex. 1012; Ex. 1014 ¶ 4. Consistent with the effective filing date we accord the challenged claims herein, Wong is prior art under 35 U.S.C. § 102(b).

Wong, like Staiger and the specification of the '705 patent, describes network communications in automobiles. Ex. 1012, 62. Wong discloses that "[v]ehicles will be home for some of the most diverse network and multiprocessing technology over the next five years," and that "[s]tandards will help improve acceptance and reduce costs." *Id.* "Leading the standardization charge for networks in automotive environments is the Controller Area Network (CAN) . . . providing a standard for real-time operating systems for the many embedded processors found in automotive networks." *Id.* Wong discloses further that CAN is not the only kind of network used in automobiles. "At the low end, the Local Interconnect Network (LIN) is being employed," and "[a] variety of multimedia networks are undergoing evaluation too, including a modified version of IEEE-1394 standard to allow operation in a more hostile environment." *Id.* (emphasis omitted). Wong provides a table listing various automobile networking standards, including, for example, CAN, CAN-A, CAN-B, CAN-C, LIN, and FlexRay. *Id.* at 66. According to Wong, "[t]he vehicle of the future will contain a variety of networks tied together primarily for management and diagnostic support. . . . One or more gateways will link various network segments." *Id.* at 64 (Fig. 1).

4. Independent Claim 7

a. Preamble

With respect to the preamble of claim 7, which recites "[a] non-transitory computer-readable medium storing a computer program product for sharing information," Petitioner relies on Staiger's disclosure of "a method and a circuit arrangement for communication within and across networks." Ex. 1001, 13:5–6; Pet. 20–21, 60. Petitioner argues that Staiger discloses a non-transitory computer-readable medium as recited because Staiger discloses that the method and circuit may be implemented using software. Pet. 20–21 (citing Ex. 1004 ¶ 83). Patent Owner does not dispute Petitioner's contention.

We find, on the basis of the evidence and explanation provided by Petitioner, that Petitioner has shown sufficiently that Staiger discloses the preamble of claim 7.

b. Element 7.1

Petitioner contends that Staiger discloses "computer code for allowing receipt of information associated with a message, utilizing a first network protocol associated with a first network," as recited in claim 7. Ex. 1001, 13:8–10; Pet. 21–22, 60. According to Petitioner, Staiger discloses receiving information associated with a message by virtue of its disclosure of an initializing process that analyzes information encoded in an incoming message received through any one of the CAN busses. Pet. 22 (citing Ex. 1004 ¶¶ 32, 36). Petitioner further contends that a person of ordinary skill in the art would have understood Staiger to disclose implementing this

feature in computer code because of the disclosure of software implementation. *Id.* Patent Owner does not dispute Petitioner's contention.

We find, on the basis of the evidence and explanation provided by Petitioner, that Petitioner has shown sufficiently that Staiger discloses this limitation.

c. Elements 7.2–7.5

Petitioner addresses the "memory-related" limitations 7.2–7.5 by reference to Figure 5, which is reproduced below, and related disclosures.

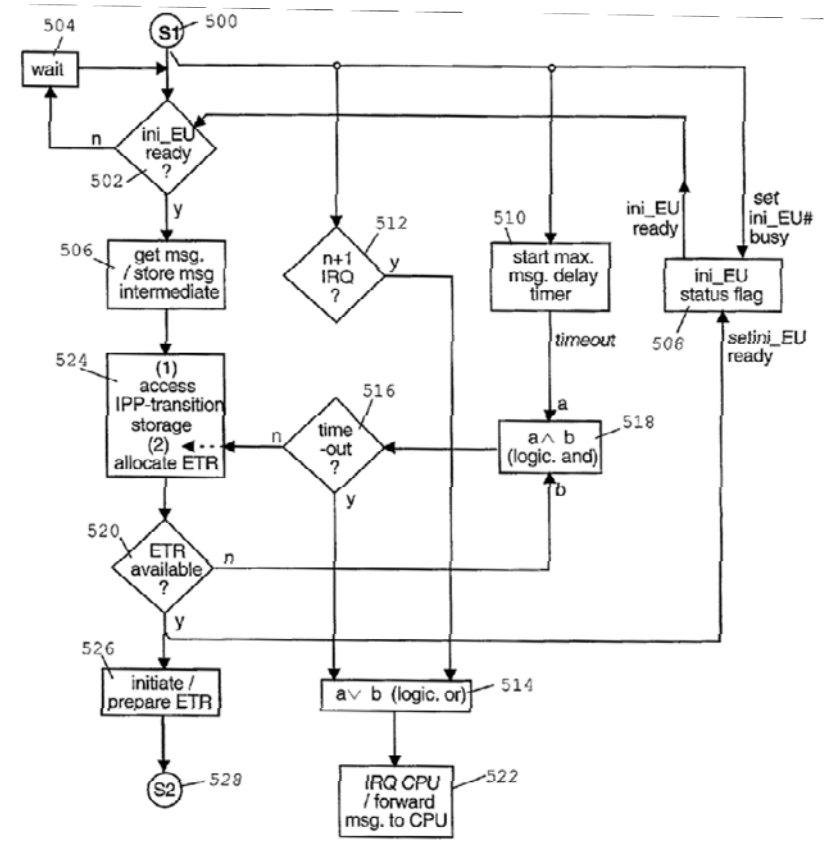


FIG. 5

Figure 5 depicts a flowchart illustration of message processing in an initializing process. Ex. 1004 ¶ 26. In explaining the relevance of this process to the claim limitations, Petitioner highlights Staiger's disclosure of determining whether a tag registry, which it correlates to the "storage resource" recited in claim 7, is available before a "time-out event" occurs. Pet. 22 (citing Ex. 1004 ¶ 62 ("Block 518 receives the time-out event from the delay timer of block 510 and a negative event of a determination of block 520 of whether or not an execution tag registry . . . is available.")). As Petitioner observes, Figure 5 of Staiger addresses circumstances both when the tag registry is available and when it is not available. *Id.* at 23–27.

If the tag registry is not available, as determined at block 520, block 516 determines whether the delay time has timed out. Ex. 1004 ¶ 62. Petitioner thus contends that element 7.2, "computer code for causing a determination as to whether a storage resource is available," is taught by this determination. Pet. 23–24 (citing Ex. 1004 ¶ 62; Ex. 1003 ¶ 98). If no time-out has occurred, another determination is made whether the tag registry is available, i.e., "causing a re-request in connection with the storage resource," as recited in element 7.3. *Id.*; Pet. 23–24. If a time-out has instead occurred, "the process passes to block 522," which issues an interrupt request that Petitioner reasonably identifies as the "error notification" recited in element 7.5. *Id.*; Pet. 27–28. If the tag registry is available, as determined at block 520, the registry is initiated, and the message is retrieved and stored, in accordance with element 7.4's recitation of "causing storage of the information utilizing the storage resource." Ex. 1004 ¶¶ 64, 66; *see* Pet. 25–27.

These steps, as identified by Petitioner from the disclosures of Staiger, track the steps recited in limitations 7.2–7.5 of claim 7 under the various circumstances when the storage resource is available or not available, and when the timeout has been reached or not been reached. Patent Owner does not dispute these identifications, which we find sufficient.

d. Elements 7.6 and 7.7

Claim 7 recites "computer code for causing the information to be shared by: in real-time, sharing the information utilizing at least one message format corresponding to a second network protocol associated with a second network which is different from the first network protocol." Ex. 1001, 13:23–27. Petitioner contends that Staiger discloses these limitations. Pet. 28–30, 60.

In addressing these limitations, Petitioner argues that Staiger discloses sharing messages with a plurality of different destinations. *Id.* at 28–29 (citing Ex. 1004 ¶¶ 35–36, 48, Fig. 1). Of particular relevance is the following disclosure, explaining aspects of Figure 2 of Staiger, reproduced above:

> The switchboard 201 is a multiplexing scheme controlled either by one of the CPUs 207 and 208 or the intercommunication preprocessor 200. This allows the CPUs 207 and 208 to use the functionality of the intercommunication preprocessor 200. *For example, a message generated by one of the CPUs 207 and 208 has to be broadcasted to several CAN busses 202 to 205 identically.* In this case, the message is multiplexed by the switchboard 201 to the intercommunication preprocessor 200, then, the intercommunication preprocessor 200 processes the message and initiates immediate distribution. This procedure significantly saves time, since the intercommunication

> preprocessor 200, specialized to operate this tasks [*sic*], will require only a fraction of processing time in comparison to a master CPU formed by one of the CPUs 207 and 208. Furthermore, the master CPU only has to execute one single message operation, in case the message needs to be computed before forwarding, which saves processing time as well.

Ex. 1004 ¶ 51 (emphasis added).

In making its argument, Petitioner observes that CPUs 207 and 208 are connected to bus systems such as FireWire or MOST, corresponding to a "first network protocol," as recited in element 7.1, and that CPUs 202–205 are connected to CAN busses, which are different and correspond to a "second network protocol." Pet. 30. In addition, Petitioner observes that the resulting information sharing occurs in "real-time" because Staiger discloses that CAN, FireWire, and MOST busses are real-time busses with a response time in "milliseconds or microseconds," consistent with our construction. *Id.* (citing Ex. 1004 ¶¶ 7, 51). We find this identification sufficient.

We recognize that Petitioner elides in its initial presentation of its argument by asserting that Staiger discloses "*receiving messages* from 'one of the CPUs 207 and 208'" when Staiger instead refers to "a message *generated* by one of the CPUs 207 and 208." Pet. 30 (emphasis added); Ex. 1004 ¶ 51 (emphasis added). This is a point also made by the dissent. *See post*, at 6–9 (Zado, APJ, dissenting). But "it is proper to take into account not only specific teachings of the reference but also the inferences which one skilled in the art would reasonably be expected to draw therefrom." *In re Preda*, 401 F.2d 825, 826 (CCPA 1968). In doing so, we note that Patent Owner concedes that Staiger "discloses that messages from the various busses are received and distributed" (although Patent Owner draws other

distinctions addressed below). PO Resp. 28 (citing Ex. 1004 ¶ 36). And Patent Owner's expert, Dr. Miller, testified on cross-examination that "the message coming through CPU 207 and 208 has to be broadcasted to the CAN busses 202 to 205 identically." Ex. 1027, 112:2–4. We thus understand Staiger to teach the broadcast of messages received CPUs 207 and 208 to CAN busses 202–205, as Petitioner asserts.

Furthermore, Staiger's disclosure is necessarily evaluated in the context of the reference as a whole, which describes a method that "focuses on message processing in a system for communicating with remote units over at least one data network and with at least one dedicated CPU." Ex. 1004 ¶ 15. After "a message to be processed is received and it is determined the kind of treatment to be performed with the received message," Staiger performs such processing and, "[f]inally, the result of the message processing is presented to be forwarded to a destination unit." *Id.* Intercommunication among the various busses shown in Figure 2, reproduced above, may occur with switchboard 201, which "is a multiplexing scheme controlled either by one of the CPUs 207 and 208 or the intercommunication preprocessor 200." *Id.* ¶ 51.

Petitioner addresses this multiplexing aspect in its Reply, an argument we find properly responsive to Patent Owner's contentions that "Staiger only describes a type of multiplexing" and that "the Patent does not suggest that multiplexing is a form of sharing." PO Resp. 29–30. In particular, Petitioner directs our attention to Figure 8 of the '705 patent and related description that suggests multiplexing is a form of "sharing." Reply 16 (citing Ex. 1001, 3:46–59, Fig. 8, 7:53–58). In addition, Patent Owner's expert, Dr. Miller, asserted on cross-examination that "I would say if you

transmit data from one device to another device, that the data has been shared with the second device. . . . Yes, you can use multiplexing for doing that." Ex. 1027, 24:2–13.

Patent Owner also disputes Petitioner's analysis for these limitations on the basis that the plain language of elements 7.6 and 7.7 requires that "the information" that is shared must be the same information that is received in element 1.1, "utilizing a first network protocol associated with a first network," and which is stored in the storage resource in element 1.5. PO Resp. 26–28. According to Patent Owner, elements 7.6 and 7.7 require "that the information associated with a first network protocol associated with a first network, which was stored in the storage resource, be shared 'utilizing a second network protocol associated with a second network.'" *Id.* at 27. Patent Owner argues that Staiger neither discloses nor enables a skilled artisan to execute these limitations because "whatever their function, busses 210 and 211 are never connected to any information stored in the storage resource, because CPUs 207 and 208 interrupt any communication between them and any storage." *Id.* at 31–32.

Part of this is essentially the same argument that we address in detail above as a matter of claim construction. As we explain there, the plain language of the claim, intrinsic evidence in the form of the Specification, and extrinsic evidence in the form of a technical-dictionary definition supports a construction of information sharing that does not require storage of the information. In advancing this argument with respect to elements 7.6 and 7.7, Patent Owner improperly seeks to import certain specific embodiments described in the Specification into the claims. But "[i]t is a 'bedrock principle' of patent law that 'the claims of a patent define the

invention to which the patentee is entitled the right to exclude." *Phillips*, 415 F.3d at 1323 (citing *Innova/Pure Water, Inc. v. Safari Water Filtration Sys., Inc.*, 381 F.3d 1111, 1115 (Fed. Cir. 2004)). The claims are "the sole measure of the grant." *Innova/Pure Water, Inc.*, 381 F.3d at 1115 (citing *Aro Mfg. Co. v. Convertible Top Replacement Co.*, 365 U.S. 336, 339 (1961)).

In addition, Patent Owner highlights the word "identically" in Staiger's disclosure of broadcasting messages from CPUs 207 and 208 to CAN busses 202–205: "The 'identically' means that all busses 202 – 205 must be the same protocol – either CAN-B or CAN-C, but not both at the same time." PO Resp. 30 (citing Ex. 2001 ¶¶ 67–68). According to Patent Owner, "[t]hat Staiger did not contemplate converting of data so as to be available for two protocols is also apparent, because Staiger does not disclose any form of conversion of data from one protocol to another." *Id.* at 31. This argument is unpersuasive because Petitioner is relying on the undisputed fact that CPUs 207 and 208 use FireWire or MOST, a different protocol than the CAN protocol used by busses 202–205.

The dissent emphasizes the other aspect of Patent Owner's argument, namely that "the information" recited in element 7.7 "must be the same *information* recited in limitation 7.1 that is associated with a received message." *See post*, at 14 (Zado, APJ, dissenting). As the dissent observes, "Staiger discloses its system receiving a message, and *processing* the message." *Id.* We do not disagree that "the message would be processed and a *new, different* message resulting from the processing would be sent to CAN buses 202 to 204." *Id.* at 15. But in concluding that "*the information* that is shared would not necessarily be the *information* that is associated

with the received message, as required by limitations 7.1 and 7.7," the dissent conflates "the information" and "the message." *See id.*

Such conflation is contrary both to the claim language and the disclosure of Staiger. That is, the claim explicitly distinguishes the *information* and the *message* by reciting, in element 7.1, "allowing receipt of information associated with a message." Ex. 1001, 12:18. Staiger similarly explains, in describing its Figure 1, that "an incoming message" is received, and that "information [is] encoded in the incoming data." Ex. 1004 ¶ 32. Although various processing is performed on the *message* in Staiger, including an "initializing process," a "dynamic process," and a "presentation process," none of these processes is described as changing the "information encoded in the incoming data." In particular, the "initializing process" "analyses an incoming message . . . and determines further processing based on configuration data . . . and information encoded in the incoming data." *Id.* ¶ 32. The "dynamic process" allows "differentiation to known state of the art processor topologies." *Id.* ¶ 33. And the "presentation process" allows "output[ting] a message as a result of the computation of the incoming message." *Id.* ¶ 35.

Although such overhead processing may prepare the received information for distribution with Staiger's multiplexing techniques, there is no indication that the informational content of the message is changed. Indeed, Staiger's summary description of this processing appears to take steps to preserve the informational content through storage in a set of registers:

> First, a message to be processed is received and it is determined the kind of treatment to be performed with the received message.

> Then message specific information specifying contents of the received message and the determined treatment of a received message are stored into a first set of registers. . . . Then the determined treatment gets performed. Meanwhile, the first set of registers are monitored in order to start presenting the result of the message processing once the processing of the message is complete. Finally, the result of the message processing is presented to be forwarded to a destination unit.

Ex. 1004 ¶ 15.

Accordingly, we find, on the basis of the evidence and explanation provided by Petitioner, and having considered Patent Owner's arguments, that Petitioner has shown sufficiently that Staiger discloses elements 7.6 and 7.7.

h. Element 7.8

Petitioner contends that the combination of Staiger and Millsap teaches or suggests that "the computer program product is associated with an electronic control unit with at least one gateway function and a plurality of interface portions," as recited in claim 7. Ex. 1001, 13:28–30; Pet. 49–53. Petitioner relies on Millsap's disclosure of electronic control units, or ECUs, in vehicle control system networks. *Id.* at 49–50 (citing Ex. 1015, abst.). According to Petitioner, the ECUs disclosed in Millsap include a plurality of interface portions because the ECUs are connected to one or more networks. *Id.* at 50 (citing Ex. 1015, 1:6–10, 2:41–46, 12:20–36, 12:42–44, Fig. 8; Ex. 1003 ¶ 137). In particular, Millsap discloses a gateway ECU comprising two communication kernels, Comm. Kernel 140 and Comm. Kernel 142, wherein each communication kernel connects to a different network, Sub-Net A and Sub-Net B, respectively. *Id.* at 51 (citing Ex. 1015, Fig. 9).

Petitioner takes the position that the communication kernels disclose interface portions because they connect to networks via busses 110 and 112, respectively, and include physical layers. *Id.* Petitioner makes a sufficient showing with these identifications.

Petitioner also articulates sufficient reasoning for combining these teachings with Staiger because both references (1) are from the same field of endeavor, i.e., are related to real-time distributed communication and control of automotive ECUs; (2) aim to solve similar problems of improving data processing between automotive ECUs; and (3) use similar techniques to solve the problems, such as using gateway ECUs to bridge different networks to allow for communication between the networks. *Id.* at 52. Petitioner supports this reasoning with testimony by Dr. Madisetti. Ex. 1003 ¶ 139. In addition, Petitioner persuasively argues that the combination would have been predictable and yielded no unexpected results: "The communication kernel described in *Millsap* was one of many very well-known and well-understood interface designs for providing data from a bus to a computing resource that a POSITA would have known could be used with the adapters of *Staiger*." Pet. 53 (citing Ex. 1015, 12:42–13:14; Ex. 1003 ¶ 141).

Patent Owner disputes whether a person of skill in the art would combine the teachings of Staiger and Millsap, but this is done more broadly in also discussing the further combination with Wong. Because that is most relevant to elements 7.9 and 7.10, we address that argument below.

We find, on the basis of the evidence and explanation provided by Petitioner, that Petitioner has shown sufficiently that the combination of Staiger and Millsap discloses element 7.8.

i. Elements 7.9 and 7.10

With respect to elements 7.9 and 7.10, which recite first and second interface portions for interfacing with first and second networks, respectively, Petitioner identifies Millsap's communication kernel 140 as a "first interface portion" and communication kernel 142 as a "second interface portion," noting that kernel 140 and kernel 142 connect to different networks, i.e., a first network and a second network. *Id.* at 53–55. For the recitation that each interface portion has a first layer part and a second layer part, Petitioner argues that the physical layer in Millsap's communication kernel reads on the claimed "first layer part," and the communication kernel's DLL reads on the "second layer part." *Id.* at 55–57. Petitioner argues that the networks in the combined system of Staiger and Millsap can be CAN, FireWire, or MOST, because Staiger expressly discloses these networks. *Id.* at 56. Petitioner further argues that a skilled artisan would have understood other networks, such as LIN and FlexRay, were in use in automotive systems at the time, and could have been used in the combined system of Staiger and Millsap. *Id.* (citing Ex. 1003 ¶ 146). Petitioner relies on Wong to support its argument regarding the understanding of a skilled artisan. *Id.* at 56–57 (citing Ex. 1012, 68, Figs. 1–2).

Petitioner provides a rationale for combining Wong with Staiger and Millsap. *Id.* at 57–58. In pertinent part, Staiger and Millsap relate to bridging different networks in automobiles, and Wong provides a description of various well known networks used in automobiles at the time. *Id.* Petitioner argues the combination would have yielded predictable results, namely, a gateway ECU that bridges between not only various types

of CAN networks described in Staiger, but also bridges with other well-known networks used in automobiles, as disclosed in Wong. *Id.* at 58.

We are persuaded by Petitioner's arguments regarding the combination of Staiger, Millsap, and Wong. Patent Owner responds that "Millsap is entirely unrelated to the invention claimed in the ['705] Patent." PO Resp. 45. In particular, Patent Owner asserts that "Millsap does not disclose, for example, any CAN, Flexray or LIN network." *Id.* (citing Ex. 2001 ¶ 114). In addition, although Patent Owner agrees that Wong discusses the potential use of CAN, LIN, and Flexray with automotive ECUs, "that is only one small part of limitation 7.10." *Id.* at 48 (citing Ex. 2001 ¶¶ 129–130).

Although limitations 7.9 and 7.10 are expressed in a lengthy manner, the concepts they recite are relatively straightforward, requiring interfaces that process first messages to produce second messages. Petitioner provides sufficient reasoning and evidence to support its position that one of skill in the art would combine the teachings of Staiger and Millsap in the manner it proposes in part because they are from the same field of endeavor and because they are reasonably pertinent to the particular problem with which the inventor of the '705 patent was concerned. *See In re Bigio*, 381 F.3d 1320, 1325 (Fed. Cir. 2004).

We find, on the basis of the evidence and explanation provided by Petitioner, that Petitioner has shown sufficiently that the combination of Staiger, Millsap, and Wong discloses elements 7.9 and 7.10.

j. Summary

Based on the foregoing, we conclude that Petitioner shows, by a preponderance of the evidence, that independent claim 7 is unpatentable under 35 U.S.C. § 103(a) over Staiger, Millsap, and Wong.

5. Claim 8

Claim 8 depends from claim 7 and recites that "the storage resource includes a bulletin board." Ex. 1001, 13:54–55. According to the Specification of the '705 patent, "the bulletin board may refer to any database that enables users to send and/or read electronic messages, files, and/or other data that are of general interest and/or addressed to no particular person/process." *Id.* at 5:9–13.

For the limitation of claim 8, Petitioner identifies execution tag registry 238, shown in Figure 2 of Staiger, reproduced above, with the recited "bulletin board resource." As Petitioner observes, "[d]ata stored by execution tag registry 238 are shared by execution units 240-244 for processing different processes, and thus are not addressed to any particular process." Pet. 33 (citing Ex. 1003 ¶ 124). In light of the Specification's explanation of a "bulletin board," we agree with Petitioner's identification, which is not separately disputed by Patent Owner.

We conclude that Petitioner shows, by a preponderance of the evidence, that claim 8 is unpatentable under 35 U.S.C. § 103(a) over Staiger, Millsap, and Wong.

6. Claim 9

Claim 9 depends from claim 7 and recites that the computer program product is operable such that "the first interface-related second layer part carries out the processing of the first interface-related first layer messages." Ex. 1001, 13:58–61. Petitioner contends that such processing is disclosed by Staiger because "the bus messages from the physical layer network are received and sent through multiplexer 222 to control engine 224 of the [intercommunication preprocessor] for processing." Pet. 38 (citing Ex. 1004 ¶¶ 38–39; Ex. 1003 ¶ 122).

Patent Owner disputes this contention, asserting that "Petitioner fails to identify [in its argument related to elements 7.6 and 7.7] where in Staiger the necessary components required by claim 9 exist." PO Resp. 40. Because we find, as discussed in Section II.F.4.d., that Petitioner does adequately identify such components, this argument is not persuasive.

In addition, Petitioner asserts that "Petitioner provides a different argument in claim 9 than for limitation 7.9." *Id.* Although true, we do not find this fatal to Petitioner's argument because, as Petitioner explains in reply, "limitation 7.9 does not specify where the processing is occurring just when." Reply 23. Petitioner elaborates on its original argument to some degree in addressing the distinction between "when" and "where" the first interface-related second layer messages are processed. *Id.* But we find this modest elaboration properly responsive to Patent Owner's argument. Specifically, we agree with Petitioner that, because bus adapters 214–217 interface with respective CAN buses 202–205 and with multiplexer 222, which forms part of switchboard 201 to provide connections to control engine 224, "the bus messages from the physical layer network are received

and sent through multiplexer 222 to control engine 224 of the [intercommunication preprocessor] for processing." *Id.* (citing Ex. 1004 ¶¶ 38–39; Ex. 1003 ¶ 122).

We conclude that Petitioner shows, by a preponderance of the evidence, that claim 9 is unpatentable under 35 U.S.C. § 103(a) over Staiger, Millsap, and Wong.

7. Claim 10

Claim 10 depends from claim 7 and recites that the computer program product is operable such that "at least one of the different processes process the information in a manner that is isolated from temporal characteristics associated with at least one of a plurality of heterogeneous networks." Ex. 1001, 13:63–67. In addressing this limitation, Petitioner observes that Staiger "discloses various examples of the execution tag registry task, none of which depends on the underlying network." Pet. 40. That is, "processing of the execution tag registry task described by *Staiger* is not any different for different networks, being it CAN-B, CAN-C, Flexray, LIN, or other." *Id.* Patent Owner does not dispute this characterization of Staiger, with which we agree. Petitioner's reasoning that Staiger thereby discloses the limitation is also consistent with our adopted constructions of "isolated from temporal characteristics" and "heterogeneous networks." *See id.*

We conclude that Petitioner shows, by a preponderance of the evidence, that claim 10 is unpatentable under 35 U.S.C. § 103(a) over Staiger, Millsap, and Wong.

8. Claim 11

Claim 11 depends from claim 7 and recites that the computer program product is operable such that "the information is shared with an operating system." Ex. 1001, 14:2–4. In addressing this limitation, Petitioner relies on Staiger's disclosure that its software-implementable invention includes a combination of hardware and software, such as "a general purpose computer system with a computer program that, when being loaded and executed, controls the computer system." Pet. 40; Ex. 1004 ¶ 83. Supported by testimony of Dr. Madisetti, Petitioner reasons that a person of ordinary skill in the art "would have understood that a general purpose computer system that executes programs has an operating system," and that "in order to carry out the information sharing methods . . . , the information has to be shared with the operating system." *Id.* at 40–41 (citing Ex. 1003 ¶ 126).

Patent Owner disputes this reasoning, contending that "Petitioner appears to conflate *requiring* an operating system to operate with *sharing information with* an operating system." PO Resp. 42 (citing Ex. 2001 ¶¶ 92–93). But Patent Owner provides insufficient explanation what distinction it is attempting to draw with that contention, and merely discounts Dr. Madisetti's testimony as lacking underlying fact or data. *Id.* at 42–43. As we can best discern, Patent Owner's contention is grounded in its position on the construction of information sharing, a position we reject for the reasons discussed *supra*. Rather, we find the point made by Dr. Madisetti that "a person of ordinary skill in the art would have understood, in order to carry out the information sharing methods disclosed in *Staiger*, the information has to be shared with the operating system" to be commensurate with our adopted construction. Ex. 1003 ¶ 126.

Accordingly, we conclude that Petitioner shows, by a preponderance of the evidence, that claim 11 is unpatentable under 35 U.S.C. § 103(a) over Staiger, Miller, and Wong.

9. Claims 12 and 13

Claim 12 depends from claim 7 and recites that the computer program product is operable such that "objects are generated based on a change of state of the information stored on the storage resource." Ex. 1001, 14:7–8. For this limitation, Petitioner observes that Staiger discloses monitoring execution tag registry 238 and "spontaneously issuing an interrupt signal whenever a change occurs in the execution tag registry." Pet. 41 (quoting Ex. 1004 ¶ 65) (citing Ex. 1004, Fig. 6; Ex. 1003 ¶ 128). Petitioner thereby reasons that "[t]he interrupt signal, therefore, is an object generated based on a change of state of the information stored on execution tag registry 238 (i.e., 'the storage resource')." *Id.* Through this observation, Petitioner makes a sufficient showing, as it does for claim 13, which depends from claim 12 and specifically recites "interrupts" as part of its limitation that the computer program product is operable such that "the objects include at least one of flags, events, signals, and interrupts." Ex. 1001, 14:10–11; Pet. 44.

Patent Owner does not separately dispute these aspects of Petitioner's analysis for claims 12 and 13. We conclude that Petitioner shows, by a preponderance of the evidence, that claims 12 and 13 are unpatentable under 35 U.S.C. § 103(a) over Staiger, Millsap, and Wong.

10. Claims 14–16

Claims 14–16 each depend from claim 7 and respectively recite that the computer program product is operable such that the real-time involves a response time that "is measured in milliseconds," "is measured in microseconds," and "is less than 1 second." Ex. 1001, 14:13–15, 14:17–19, 14:21–23. Petitioner addresses these limitations with Staiger's express disclosure of "real-time capability of the bus system, i.e., the capability of a system to respond to stimuli within some small upper limit of response time, typically milliseconds or microseconds." Pet. 44–45; Ex. 1004 ¶ 7. Because this disclosure meets the claim limitations, which Patent Owner does not separately dispute, Petitioner makes a sufficient showing.

We conclude that Petitioner shows, by a preponderance of the evidence, that claims 14–16 are unpatentable under 35 U.S.C. § 103(a) over Staiger, Millsap, and Wong.

11. Claims 17 and 19

Claims 17 and 19 each depend from claim 7, with claim 17 reciting that the computer program product is "part of an apparatus including a plurality of layers including at least two of an application layer, a middleware layer, a real-time operating system layer, a device driver layer, and a hardware abstraction layer," and claim 19 reciting that the computer program product is operable such that "at least a portion of the message is processed at each of a plurality of layers." Ex. 1001, 14:25–29, 14:35–37. Petitioner addresses the layer structure by drawing the following correspondences between the list recited in the claim and aspects of Staiger: (1) between the CAN physical layers and the recited "hardware abstraction

layer"; (2) between bus adapters 214–217 and CPUs 207, 208 and the recited "device driver layer"; (3) between control engines 224 and intercommunication preprocessor preset interface 234 and the recited "middleware layer"; and (4) between DP execution unit, with execution units 240–244 and the recited "application layer." Pet. 45 (citing Ex. 1004 ¶¶ 38–39, Fig. 2). These identifications are supported by testimony of Dr. Madisetti and are not disputed by Patent Owner. Ex. 1003 ¶ 130.

With such correspondences, Petitioner further addresses the message processing of claim 19 by observing that Staiger discloses that an incoming message is received and processed by these identified elements in succession. Pet. 47–48 (citing Ex. 1004 ¶¶ 38–39, Fig. 2). This is also supported by testimony of Dr. Madisetti and is not disputed by Patent Owner. Ex. 1003 ¶ 132.

We agree with these identifications, and credit Dr. Madisetti's unrebutted testimony on these points. Accordingly, we conclude that claims 17 and 19 are unpatentable under 35 U.S.C. § 103(a) over Staiger, Millsap, and Wong.

12. Claim 18

Claim 18 depends from claim 7 and recites that the computer program product is operable such that "multiple modes of operation are enabled, wherein at least one of the modes includes a diagnostic mode." Ex. 1001, 14:31–33. As noted above, we agree with Patent Owner that a "diagnostic mode" is distinct from a normal-operation mode, and allows inspection of the system while it is running.

The Petition identifies aspects of Staiger's operation that it contends are "diagnostic in nature." Pet. 47. Specifically, the Petition points to Staiger's disclosure of monitoring and interpreting execution tag registry 238 by "either using a round-robin procedure, or a procedure spontaneously issuing an interrupt signal whenever a change occurs in the execution tag registry." *Id.* (citing Ex. 1004 ¶¶ 43, 65, 72). In addition, the Petition identifies Staiger's disclosure of an "interrupt monitor" that "catches interrupt and initiates further processing." *Id.* (citing Ex. 1004 ¶ 57).

Patent Owner responds, and we agree, that even if such tasks are diagnostic in nature, "that does not mean the computer program is running in a diagnostic mode. . . . All it teaches is a normal operation mode that happens to include monitoring to ensure efficiency." PO Resp. 44. Patent Owner supports these assertions with testimony by Dr. Miller. Ex. 2001 ¶ 99–101.

We are not persuaded by Petitioner's chain of inferences offered in reply, namely that a person of skill in the art "would understand that when an interrupt occurs at the OS level that there exists custom code that is executed to handle the interrupt" and "would understand that this custom code is an 'alternate mode of operation, distinct from normal operations.'" Reply 26. Although Petitioner cites to Dr. Madisetti's Declaration, we do not discern support for such inferences in his testimony, and accordingly find them unpersuasive. *See Gemtron Corp. v. Saint-Gobain Corp.*, 572 F.3d 1371, 1380 (Fed. Cir. 2009) ("unsworn attorney argument . . . is not evidence and cannot rebut . . . evidence").

We conclude that Petitioner does not show, by a preponderance of the evidence, that claim 18 is unpatentable under 35 U.S.C. § 103(a) over Staiger, Millsap, and Wong.

G. Anticipation by Staiger

Because we find, as discussed *supra* in Section II.F.12, that Staiger does not disclose the limitation of claim 18, we conclude that claim 18 is also not anticipated by Staiger. The anticipation challenges of claims 7–17 and 19 over Staiger are moot in light of our conclusion that those claims are unpatentable for obviousness over Staiger, Millsap, and Wong, and we accordingly do not further address them.

H. Constitutionality of Inter Partes Review Proceedings

Patent Owner contends that "this IPR should be terminated and the petition dismissed because the IPR system is unconstitutional." PO Resp. 51. This argument is foreclosed by the Supreme Court's determination otherwise. *Oil States Energy Services, LLC v. Greene's Energy Group, LLC*, 138 S. Ct. 1365, 1370 (2018) ("In this case, we address whether inter partes review violates Article III or the Seventh Amendment of the Constitution. We hold that it violates neither.").

I. Estoppel

Petitioner argues that under 37 C.F.R. § 42.73(d)(3)(i) Patent Owner is estopped from arguing any claim not patentably distinct from those held unpatentable. Reply 2. Rule 42.73(d)(3) states "[a] patent applicant or owner is precluded from taking action inconsistent with the adverse

judgment, including obtaining in any patent: (i) [a] claim that is not patentably distinct from a finally refused or canceled claim." We do not reach this issue because (1) Petitioner has made a sufficient showing with respect to claims 7–17 and 19, even considering Patent Owner's arguments; and (2) the limitation of claim 18 ("wherein at least one of the modes includes a diagnostic mode") does not have a counterpart that has been addressed in any of the proceedings identified by Petitioner, i.e. IPR2017-00676, IPR2017-00677, IPR2017-00457, and IPR2017-00458. *See* Reply 2.

III. ORDER

It is

ORDERED that, based on a preponderance of the evidence, claims 7–17 and 19 of U.S. Patent No. 8,209,705 B2 are held to be unpatentable;

FURTHER ORDERED that claim 18 has not been shown to be unpatentable; and

FURTHER ORDERED that, because this is a final written decision, parties to this proceeding seeking judicial review of our decision must comply with the notice and service requirements of 37 C.F.R. § 90.2.

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

BMW OF NORTH AMERICA, LLC,
Petitioner,

v.

STRAGENT, LLC,
Patent Owner.

Case IPR2017-01521
Patent 8,209,705 B2

Before LYNNE E. PETTIGREW, PATRICK M. BOUCHER, and CHRISTA P. ZADO, *Administrative Patent Judges*.

ZADO, *Administrative Patent Judge*, dissenting.

I respectfully dissent from my colleagues' determination that Petitioner has shown the challenged claims of the '705 patent are unpatentable. In my view, the majority decision finds incorrectly that Petitioner has established, by a preponderance of the evidence, that the challenged claims are unpatentable.

I. INTRODUCTION

Of the claims challenged by Petitioner, claim 7 is independent, and claims 8–19 depend from claim 7. Petitioner asserts, under all asserted grounds, that Staiger discloses limitation 7.7 of claim 7. Pet. 30 (arguing with regard to its first ground that Staiger discloses limitation 7.7); *id.* at 48–

60 (arguing with regard to its second ground, i.e., obviousness over the combination of Staiger, Millsap, and Wong, limitations 7.8–7.10, but not including any additional arguments for limitation 7.7). For reasons stated below, it is my view that Petitioner has not shown sufficiently that Staiger discloses limitation 7.7, and therefore, has not established unpatentability of claim 7 by a preponderance of the evidence.

Claims 8–19 depend either directly or indirectly from claim 7, and therefore include all the limitations of claim 7. Petitioner does not set forth additional evidence or arguments for theses dependent claims that addresses the shortcomings of the arguments for limitation 7.7. *Id.* at 35–48. Therefore, it is my view that Petitioner also had not established unpatentability of claims 8–19 by a preponderance of the evidence.

II. ANALYSIS

A. Principles of Law

To prevail on its challenges, Petitioner must demonstrate by a preponderance of the evidence that the claims are unpatentable. 35 U.S.C. § 316(e); 37 C.F.R. § 42.1(d). "In an [*inter partes* review], the petitioner has the burden from the onset to show with particularity why the patent it challenges is unpatentable." *Harmonic Inc. v. Avid Tech., Inc.*, 815 F.3d at 1363. It is incumbent upon Petitioner to identify, in the Petition, "in writing and with particularity each claim challenged, the grounds on which the challenge to each claim is based, and the evidence that supports the grounds for the challenge to each claim." 35 U.S.C. § 312(a)(3); *see also Intelligent Bio-Systems, Inc. v. Illumina Cambridge Ltd.*, 821 F.3d 1359, 1369 (2016) ("It is of the utmost importance that petitioners in the IPR proceedings

adhere to the requirement that the initial petition identify 'with particularity' the 'evidence that supports the grounds for the challenge to each claim.' 35 U.S.C. § 312(a)(3).''). Although the burden of production may shift, the burden of persuasion on the issue of patentability remains with Petitioner always and never shifts to Patent Owner. *Dynamic Drinkware, LLC v. Nat'l Graphics, Inc.*, 800 F.3d 1375, 1378 (Fed. Cir. 2015).

Petitioner asserts unpatentability under both §§ 102 and 103. Pet. 12. To establish anticipation, each and every element in a claim, arranged as recited in the claim, must be found in a single prior art reference. *Net MoneyIN, Inc. v. VeriSign, Inc.*, 545 F.3d 1359, 1369 (Fed. Cir. 2008); *Karsten Mfg. Corp. v. Cleveland Golf Co.*, 242 F.3d 1376, 1383 (Fed. Cir. 2001). Prior art references must be "'considered together with the knowledge of one of ordinary skill in the pertinent art.'" *In re Paulsen*, 30 F.3d 1475, 1480 (Fed. Cir. 1994). Also, "it is proper to take into account not only specific teachings of the reference but also the inferences which one skilled in the art would reasonably be expected to draw therefrom." *In re Preda*, 401 F.2d 825, 826 (CCPA 1968). As the Court of Appeals for the Federal Circuit recently explained, the dispositive question for anticipation is whether one skilled in the art would reasonably understand or infer from a prior art reference that every claim element is disclosed in that reference. *Eli Lilly v. Los Angeles Biomedical Research Inst.*, 849 F.3d 1073, 1074–1075 (Fed. Cir. 2017).

A claim is unpatentable for obviousness under 35 U.S.C. § 103(a) if the differences between the claimed subject matter and the prior art are "such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which

said subject matter pertains." *KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. 398, 406 (2007). The question of obviousness is resolved on the basis of underlying factual determinations, including: (1) the scope and content of the prior art; (2) any differences between the claimed subject matter and the prior art; (3) the level of skill in the art; and (4) when in evidence, objective indicia of non-obviousness, i.e., secondary considerations. *Graham v. John Deere Co.*, 383 U.S. 1, 17–18 (1966). Furthermore, Petitioner does not satisfy its burden of proving obviousness by employing "mere conclusory statements." *In re Magnum Oil Tools Int'l, Ltd.*, 829 F.3d 1364, 1380 (Fed. Cir. 2016).

B. Claim 7

> *"[7.6] computer code for causing the information to be shared by:"*
>
> *"[7.7] in real-time, sharing the information utilizing at least one message format corresponding to a second network protocol associated with a second network which is different from the first network protocol"*

Limitations 7.6 and 7.7 recite "computer code for causing *the information* to be shared by: in real-time, sharing the information utilizing at least one message format corresponding to a second network protocol associated with a second network which is different from the first network protocol." Ex. 1001, 13:23–27 (emphasis added). The parties do not dispute, and the majority does not state otherwise, that "*the* information" as recited in limitations 7.6 and 7.7 refers to the same information recited in

limitation 7.1.[5] Limitation 7.1 recites "computer code for allowing receipt of *information* associated with a message, utilizing a first network protocol associated with a first network." *Id.* at 13:8–10 (emphasis added). In light of this antecedent, limitations 7.6 and 7.7 require code that causes sharing of *the same information* that is received in a message that uses a first network protocol, and sharing that *information* using a different, second network protocol.

1. Petitioner's Argument

> *"sharing the information utilizing at least one message format corresponding to a second network protocol associated with a second network that is different from the first network protocol"*

For reasons discussed below, contrary to Petitioner's assertion, I would find that Staiger does not disclose limitation 7.7.

Petitioner relies on Staiger alone for disclosure of "sharing the information utilizing at least one message format corresponding to a second network protocol associated with a second network that is different from the first network protocol," as recited in limitation 7.7. Pet. 30. Petitioner's argument is that Staiger satisfies this limitation vis-à-vis disclosure that one of CPUs 207 and 208 receives a message from one of buses 210 or 211 and broadcasts the message to several of CAN buses 202 to 205 identically. *Id.* Petitioner's theory is that a message using a first network protocol (e.g., FireWire or MOST), as required by limitation 7.1, is received by one of

[5] As discussed in the majority decision, the parties dispute whether "the information" must also be stored, as recited in limitation 7.4. Majority Dec. 14–18, 36–37. I agree with my colleagues that the claim does not require the information to be stored.

CPUs 207 and 208 from one of buses 210 and 211. *Id.* Furthermore, the received message is converted by one of CPUs 207 and 208 into a message that uses a second network protocol (e.g., CAN), and then is shared via broadcasting to several of CAN buses 202 to 205. *Id.* Petitioner does not present any alternative theory as to how Staiger discloses limitation 7.7. *Id.*[6]

Contrary to the argument and theory upon which Petitioner relies, Staiger does not expressly disclose CPUs 207 and 208 broadcasting a message *received from* buses 210 and 211 to CAN buses 202 to 205. Petitioner's argument in the Petition on this issue (except for the observation that CAN buses come in two types), in its entirety, is reproduced below:

> *Staiger* discloses element 7.7 . . . because it discloses that its software implementable invention includes receiving messages from "one of the CPUs 207 and 208" and broadcasting the message "to several CAN busses 202–205 identically." EX1004, ¶51; EX1003, ¶108. CPUs 207–208 are connected to bus systems such as FireWire or MOST (i.e., a "first network protocol"), which are different than CAN busses 202–205 (i.e., a "second network protocol"). EX1004, ¶36.

Pet. 30. Here, Petitioner identifies disclosure in Staiger of a scenario in which one of CPUs 207 and 208 broadcasts a message to CAN buses 202 to 205 identically. Ex. 1004 ¶ 51. However, Staiger does not say that this message is received from buses 210 or 211. *Id.* On the contrary, Staiger

[6] Petitioner observes that CAN buses can use either the CAN-B or CAN-C protocol, which Petitioner argues are different network protocols. Pet. 30. However, Petitioner does not present any argument regarding receiving messages from one of Staiger's CAN buses and sharing that information with another of Staiger's CAN buses. *Id.*

says that this message is *generated by one of CPUs 207 and 208*. *Id.* Nowhere does Staiger disclose that this message comes from any source other than one of CPUs 207 and 208.

The only disclosure regarding buses 210 and 211 includes the statement that they are connected to CPUs 207 and 208, and identification of the network protocols the buses may use. Aside from the depiction in Figure 2 showing a connection between buses 210 and 211 and CPUs 207 and 208, the entire disclosure regarding these buses is reproduced below:

> The first and the second CPU 207 and 208 are providing connections to first and second additional bus systems 210 and 211, respectively. The additional first and second bus systems 210 and 211 might be different from each other and formed by, e.g., a FireWire system, i.e., a high performance serial bus specified according to IEEE 1394, or any other kind of multimedia bus, such as, e.g., MOST (Media Oriented Systems Transport).

Ex. 1004, ¶ 36. As is readily seen from this disclosure, Staiger never explains the purpose of buses 210 and 211, nor describes what they are connected to (aside from CPUs 207 and 208). Nor does Staiger disclose the types of messages CPUs 207 and 208 receive from buses 210 and 211, and in particular, whether these messages contain information to be shared with CAN buses 202 to 205.

Based on the foregoing, there is no question that Staiger does not expressly disclose that the message broadcast from one of CPUs 207 and 208 to CAN buses 202 to 205 is received from one of buses 210 to 211.

In the absence of any express disclosure, it is proper to take into account the inferences which one of skill in the art would be reasonably

expected to draw from Staiger. *In re Preda*, 401 F.2d at 826; *Eli Lilly v. Los Angeles Biomedical Research Inst.*, 849 F.3d at 1074–1075. With regard to the inferences a skilled artisan would reasonably have drawn, Petitioner bears the burden of demonstrating that a person of ordinary skill in the art would have inferred that Staiger discloses that the message broadcast from one of CPUs 207 and 208 comes in through one of buses 210 and 211. However, on this point, the Petition is utterly silent. Pet. 30. As discussed above, the Petition provides only two sentences of argument, neither of which addresses the inferences a skilled artisan would have drawn. *Id.* Indeed, the Petition does not even assert that a skilled artisan would have inferred that messages broadcasted by CPUs 207 to 208 to CAN buses 202 to 205 are received from buses 210 and 211 and converted from one protocol to another by the CPUs, as required by limitation 7.7. Rather, the Petition merely points out that buses 210 and 211 are connected to CPUs 207 and 208, without stating what inferences would have been drawn, and why. *Id.* (stating that "CPUs 207–208 are connected to bus systems such as FireWire or MOST (i.e., a 'first network protocol'), which are different than CAN busses 202–205 (i.e., a second network protocol')."). However, given that Staiger says the message to be broadcasted is *generated by one of CPUs 207 and 208*, Petitioner needs to explain why a skilled artisan would have drawn the inference that the message, rather than being generated by one of the CPUs as stated in Staiger, instead comes another source. Furthermore, in view of Staiger's lack of description regarding buses 210 and 211, Petitioner needs to explain why a skilled artisan would have inferred that the other source for the message is one of buses 210 and 211. Regardless of whether Petitioner could have presented sufficient argument and evidence regarding

the inferences a skilled artisan would have drawn, Petitioner clearly has not done so here.

In addition to the argument in the Petition, Petitioner argues in the Reply that Dr. Miller provides testimony that supports its position. Reply 18–19. However, his testimony does not support Petitioner's position. In particular, Petitioner asserts that "Dr. Miller confirms busses 210 and 211 broadcast to busses 202 to 205." *Id.* at 18. However, contrary to Petitioner's assertion, Dr. Miller makes no such statement in his testimony. This is discussed more fully below in connection with the majority's reliance on the same testimony by Dr. Miller, *infra* Section II.B.3.

In my view, absent sufficient explanation from Petitioner, as well as underlying evidence, Petitioner has not satisfied its burden. For the foregoing reasons, it is my view that Petitioner has failed to show that Staiger discloses one of CPUs 207 and 208 broadcasting to CAN buses 202 to 205 a message *received from one of buses 210 and 211*. Because this is the only theory upon which Petitioner relies to show disclosure of limitation 7.7, Petitioner has failed to show that Staiger discloses this limitation.

2. Evidence Discussed in the Majority Decision

Although the majority finds Petitioner has shown with sufficiency that Staiger discloses this limitation, the majority relies not on express disclosure—which, for reasons expressed above, Staiger lacks—but, rather on what a person of ordinary skill in the art would have inferred Staiger discloses. Majority Dec. 34–35. However, as discussed above and below, it is my view that the record lacks sufficient argument and evidence to draw the inferences necessary for Petitioner to prevail.

3. Dr. Miller's Testimony

To support its decision, the majority relies on an admission by Patent Owner's expert, Dr. Miller, that "the message *coming through* CPU 207 and 208 has to be broadcasted to the CAN busses 202 to 205 identically." Majority Dec. 34–35 (citing Ex. 1027, 112:2–4) (emphasis added). Based on this testimony, the majority "understand[s] Staiger to teach the broadcast of messages *received by* CPUs 207 and 208 to CAN busses 202–205, as Petitioner asserts." *Id.* at 35 (emphasis added). I respectfully disagree that Staiger discloses the broadcast of messages *received by* CPUs 207 and 208 to CAN buses 202–205. As discussed above, the disclosure upon which the majority relies states that the broadcasted messages are *generated by* one of CPUs 207 and 208. Ex. 1004, ¶ 51. Moreover, even if it were true that Staiger discloses that the messages broadcasted by CPUs 207 and 208 are *received by*, rather than *generated by*, the CPUs, there is no explanation as to how Dr. Miller's testimony, and the majority's understanding, leads to any inference that the received message is from one of *buses 210 and 211*, as required under Petitioner's theory. The majority does not, in citing Dr. Miller's testimony, concede that Staiger expressly discloses that the broadcasted message comes from buses 210 and 211. Majority Dec. 34–35 (the majority stating that it "understand[s] Staiger to teach the broadcast of messages received CPUs 207 and 208 to CAN busses 202–205," but omitting any discussion of the message coming in through buses 210 and 211).

Petitioner attempts, in its Reply, to rely on this testimony by Dr. Miller to support its assertion that "Dr. Miller confirms busses 210 and 211 broadcast to busses 202 to 205. Reply 18–19 (citing Ex. 1027, 111:19–

112:4). However, as discussed below, Dr. Miller's testimony does not support these assertion.

Petitioner takes out of context Dr. Miller's testimony that "the message coming through CPU 207 and 208 has to be broadcasted to the CAN busses 202 and 205 identically." First, Dr. Miller never testifies that messages coming through CPUs 207 and 208 are *received from buses 210 and 211*. Rather, Dr. Miller reads verbatim a sentence in Staiger that neither party disputes, namely that Staiger discloses an exemplary scenario in which a message *generated by one of CPUs 207 and 208* has to be broadcasted to several CAN buses 202 to 205 identically, and confirms what he had read.

> Q My question was: Does Staiger disclose that CPU 207 and 208 communicate through bus adapters 214, 215, 216, and 217?
>
> THE WITNESS: I don't see that it specifically says that. The sentence that I see here, which I read earlier in paragraph 51 says, "A message generated by one of the CPUs 207 and 208 has to be broadcasted to several CAN busses 202 to 205 identically."
>
> Q BY MR. DAMON [Petitioner's counsel]: And from Figure 2, how would CPUs 207 and 208 communicate with busses 202 through 205? For simplicity, you can pick any one from 202 to 205. You don't have to explain all four of them.
>
> THE WITNESS: Well, somehow it has to make it on to—what is that?—bus 222. I'm looking at the specification, the multiplexer 222.
>
> Q BY MR. DAMON: And in Figure 2, do you see any other lines between 207 and 208 that CAN busses 202 through 205 also communicate through that is not the multiplexer 222?

A No, I don't.

BY MR.DAMON [Petitioner's counsel]: But you agree that CPUs 207 and 208 can communicate with CAN busses 202 to 205?

THE WITNESS: Again, the sentence says in paragraph 51, "CPUs 207 and 208 has to be broadcasted to several CAN busses 202 to 205 identically."

Q BY MR. DAMON: Is that a yes or no?

A So the message coming through CPU 207 and 208 has to be broadcasted to the CAN busses 202 to 205 identically.

Ex. 1027, 110:15–112:9 (counsel objections omitted). Although this testimony confirms that Staiger discloses one of CPUs 207 and 208 broadcasting a message to CAN buses 202 to 205 identically, there is nothing in this testimony about the message being received from buses 210 or 211. Moreover, whatever may have been meant by the particular phrasing used by Dr. Miller, namely "[s]o the *message coming through* CPU 207 and 208," it does not override the disclosure of Staiger, which says nothing about the messages being broadcasted as *coming through* CPUs 207 and 208, but rather states that CPU 207 or 208 *generates* the message. Ex. 1004, ¶ 51.

Rather than concede that the message to be broadcasted comes through buses 210 and 211, in the very next line, omitted by Petitioner and not discussed in the majority decision, Dr. Miller states that the message is *generated by* CPUs 207 and 208. *Id.* at 112:7–8. Later in this line of questioning, Dr. Miller clarifies several times that he does not admit that Staiger discloses any conversion between protocols, e.g., that a message

coming in from bus 210 or 211 in FireWire or MOST format is converted by CPU 207 or 208 for broadcast to CAN buses 202 to 205. *Id.* at 119:7–8 ("I'm not admitting anything about conversions coming in with Staiger and Figure 2); *id.* at 119:16–18 ("I'm not admitting that there's any conversion going on between the protocols going out on any of the wires"); *id.* at 109:23–110:3 ("But I want to clarify something here because I don't want my answers to be taken out of context and misrepresented. Nowhere does Staiger disclose that a message of a certain format is coming in, being converted, and going back out on a different line as a different protocol."). For the foregoing reasons, contrary to Petitioner's assertion, Dr. Miller's testimony does not support an inference that in Staiger's system CPUs 207 and 208 broadcast a message *from buses 210 and 211* to buses 202 to 205. Therefore, it is my view that Dr. Miller's testimony, when taken in context, does not support Petitioner's overall assertion that Staiger discloses limitation 7.7.

4. Staiger's Disclosure of Processing messages and forwarding the result to a destination unit using multiplexing

It is not clear that the majority relies on any additional evidence, other than Dr. Miller's single statement about messages coming through CPUs 207 and 208—which Petitioner takes out of context—to arrive at its finding that a skilled artisan would have inferred Staiger discloses broadcasting messages received from buses 210 and 211. The majority states Staiger's disclosure necessarily is evaluated in the context of the reference as a whole, and references disclosure about processing messages that are multiplexed, but this appears to go toward an issue raised by Patent Owner as to whether multiplexing can be considered a form of "sharing

information," rather than to whether Staiger discloses broadcasting messages received from buses 210 and 211. Majority Dec. 35 ("Petitioner addresses this multiplexing aspect in its Reply, an argument we find properly responsive to Patent Owner's contentions that 'Staiger only describes a type of multiplexing,' and that 'the Patent does not suggest that multiplexing is a form of sharing.'"). In any event, this discussion does not mention buses 210 and 211. It states that Staiger describes message processing, noting that after a message to be processed is received, it is determined the kind of treatment to be performed with the received message, and that the result of the message processing is forwarded to a destination unit. *Id.* However, even though Staiger discloses processing received messages and sending out the results, Staiger still lacks disclosure that the received messages to be processed come in from buses 210 and 211. In view of this lack of disclosure, it is my view that to satisfy its burden *Petitioner* needs to provide at least some explanation as to why a skilled artisan would have inferred that the messages processed by Staiger's system come in through buses 210 and 211.

Moreover, Staiger's disclosure of message processing highlights an additional, significant failure of Petitioner's arguments. As discussed above, limitation 7.7 refers to code for causing sharing of *the information*, which must be the same *information* recited in limitation 7.1 that is associated with a received message. However, the message output by Staiger's system, e.g., the message it shares, is not the same message it receives. Staiger discloses its system receiving a message, and *processing* the message. Ex. 1004, ¶¶ 32–33, 35. The processing includes performing computations on data in the message, and "assembl[ing] a *new* message" from the data that results

from processing the message that was received, and outputting the new message. *Id.* ¶ 46–47; *id.* ¶ 33 (after analyzing an incoming message, "the message is subject of the second process that is called 'dynamic process'"); *id.* ¶ 35 ("output[ing] a message 112 as a result of the computation of the incoming message 102"). Processing of messages, and outputting a *new* message is not merely an embodiment of Staiger. It is described as the invention. *Id.* ¶ 15 (in the Summary of Invention, "[t]he method focuses on message processing . . . [f]irst, a message to be processed is received and it is determined the kind of treatment to be performed with the received message" and "once a process execution unit is available for processing", then "the determined treatment gets performed . . . [f]inally the result of the message processing is presented to be forwarded to the destination unit."); *id.* at [57] ("The message processing device according to the present invention includes a first execution unit for receiving a message to be processed and determining the kind of treatment to be performed with the received message, a second execution unit for performing the determined treatment, and a third execution unit for presenting the result of the message processing to be forwarded to a destination unit.").

Therefore, even if a message received by one of CPUs 207 and 208 "came through" from one of buses 210 and 211, as argued by Petitioner, Staiger's teachings taken as a whole indicate that the message would not be broadcasted to CAN buses 202 to 205. Rather, the message would be processed, and a *new*, *different* message resulting from the processing would be sent to CAN buses 202 to 205. Accordingly, *the information* that is shared would not necessarily be the same *information* that is associated with the received message, as required by limitations 7.1 and 7.7.

It is Petitioner's burden to show the information is the same. Petitioner does not identify what it contends to be *the information* associated with the received message, nor explain how Staiger discloses that this information is in the output message. Pet. 30. Petitioner does not discuss Staiger's disclosure that the output message is new, and not the same as the received message, nor explain why a skilled artisan would have inferred, nonetheless, that the information in the new output message is the same as the information in the received message. *Id.* For this additional reason, I would find that Petitioner has not shown sufficiently that Staiger discloses limitation 7.7

5. Multiplexing as sharing; shared information; identically

The remainder of the discussion by the majority regarding limitation 7.7 does not relate to whether the message broadcast by one of CPUs 207 and 208 is received from one of buses 210 and 211. The majority addresses arguments raised by Patent Owner as to whether multiplexing is a form of sharing, whether *the information* in limitation 7.7 must be stored as recited in limitation 7.4, and whether broadcasting a message "identically" to CAN buses 202 to 205 means that Staiger's system is incapable of converting data so as to be available in two protocols. Majority Dec. 35–37. This discussion by the majority does not appear to include any additional evidence or considerations leading to the majority's finding that Staiger discloses that the message broadcast by one of CPUs 207 and 207 is received from one of buses 210 and 211.

6. Summary

For the foregoing reasons, I would find that Petitioner has not set forth sufficient evidence and argument that Staiger discloses limitation 7.7 of

claim 7. In particular, Staiger does not expressly disclose this limitation, and Petitioner has not set forth argument and evidence sufficient to show that a skilled artisan would have inferred that Staiger discloses it. Therefore, it is my view that Petitioner has not established, by a preponderance of the evidence, that claim 7 is unpatentable. Also, for similar reasons, as discussed *supra* Section II.B., it is my view that Petitioner has not established, by a preponderance of the evidence, that claims 8–19 are unpatentable.

III. CONCLUSION

The majority reaches the incorrect conclusion that Petitioner has established, by a preponderance of the evidence, that claims 7–19 of the '705 patent are unpatentable. From the majority's contrary decision, I respectfully dissent.

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